EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

Single European Sky

Catherine Gandolfi

SESAR coordinator

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Your safety is our mission.
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Overview

What is SES? What for?

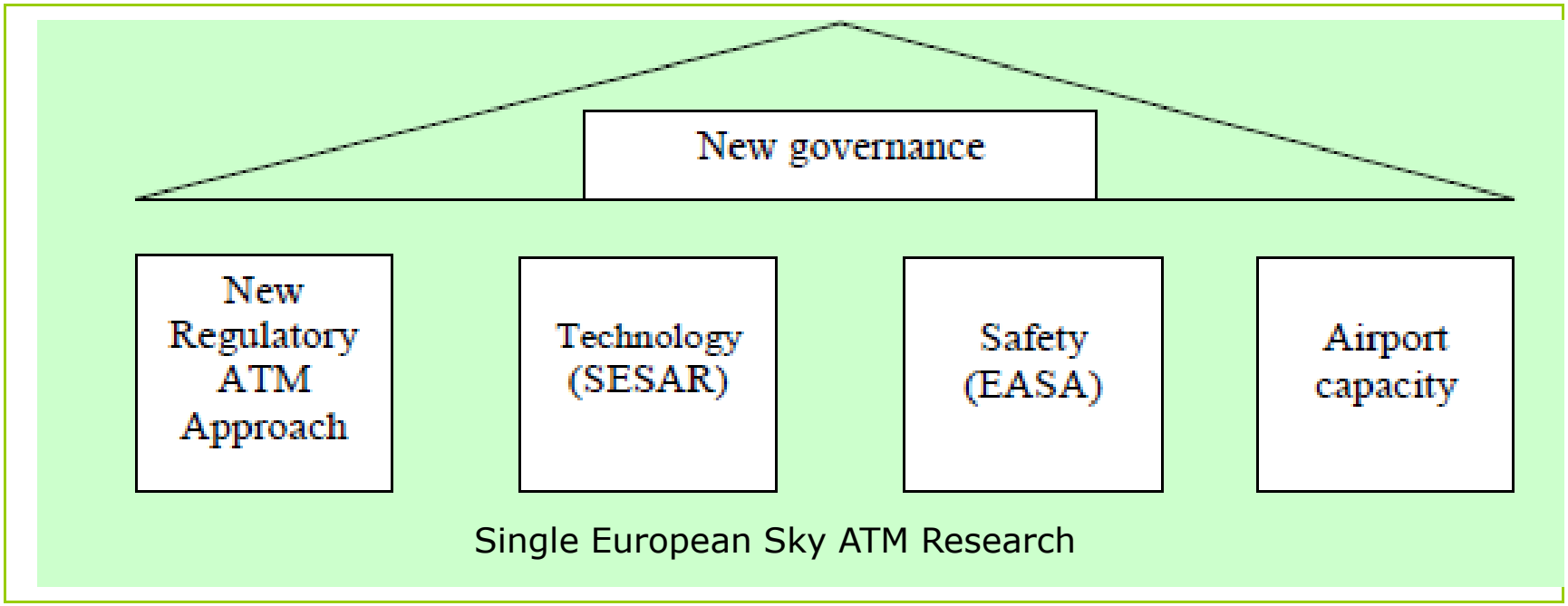
What is SESAR? (SES ATM Research)

Outline

What are the main drivers for avionics?

Mandates

SES: Building a new Aviation Governance

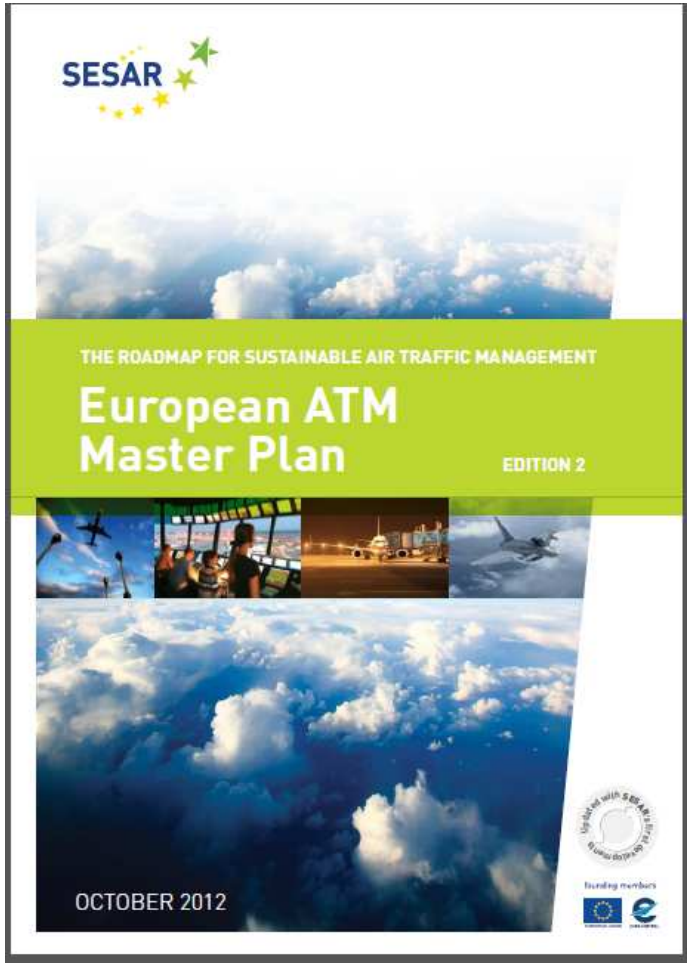


Source: press release SES II 03/03/2010
http://ec.europa.eu/transport/air/single_european_sky/ses_2_en.htm

SES – Recommendations from HLG

- HLG → civil, military, EC, Eurocontrol, industry, passenger associations
- Recommendations
  - strong Community regulator
  - airspace considered as a **common resource**
  - promote **new technologies** and improve **interoperability** between systems and technologies

Objectives of SESAR



- SESAR is more than SJU work programme
  - Regulatory Roadmap
  - Standardisation Roadmap
  - Implementation of mature changes

Visit:
https://www.atmmasterplan.eu/

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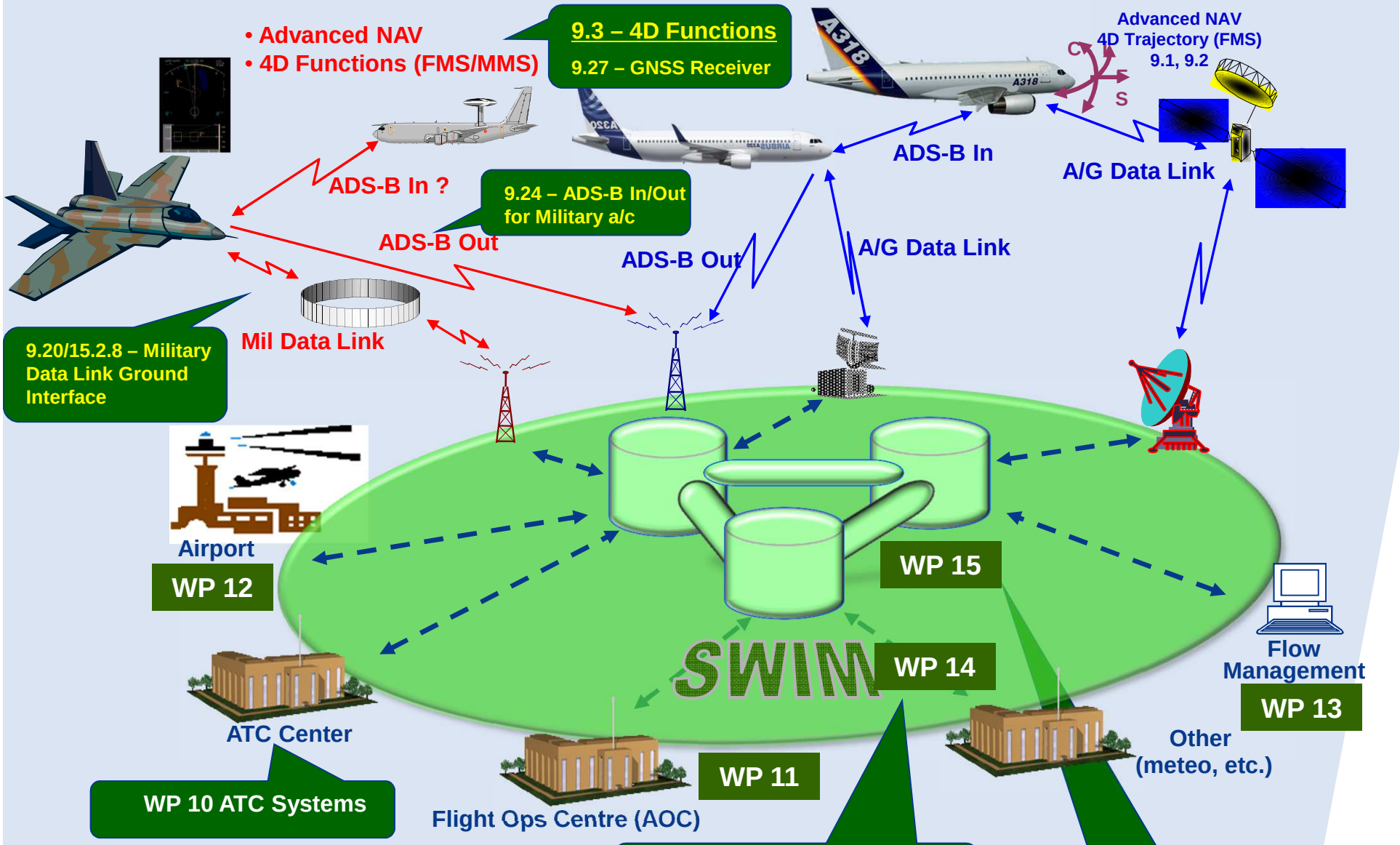

A Work Package per flight phase

IFR operations with SESAR

- Evolution of navigation infrastructure
  - Progressive removal of ground NAVAIDS (VOR, NDB, ILS?)
  - Higher reliance on satellite guidance (GNSS)
- Transfer to PBN (performance based navigation) operations
- Significant changes in ATM systems (new services like e.g. meteorological information)

SES regulations - overview

Framework
549/2004+
1070/2009

EASA
216/2008+
1108/2009

- TCAS

Performance scheme
691/2010 + amendments

Service provision
550/2004+
1070/2009

- Common charging scheme
- Functional airspace blocks
- Software safety assessment

Airspace regulation
551/2004+
1070/2009

- Flexible use of airspace
- Airspace classification
- Air Traffic Flow Management
- Network management

Interoperability
552/2004+
1070/2009

See next slides

- Automatic transfer of flights
- Flight Transfer Message Protocol
- Flight Plans
- Coordinated allocation and use of Mode S codes
- Quality aeronautical data and information

Regulatory framework

SES - Interoperability

- (EC) 552/2004
  - Article 5 EC declaration of conformity or suitability for use of constituents
  - 1. Constituents shall be accompanied by an EC declaration of conformity or suitability for use. The elements of this declaration are set out in Annex III.

Air-Ground interoperability

- VHF 8.33 (EC 1265/2007)
- Data link Services (EC 29/2009)
- Performance and the interoperability of surveillance (SPI) (1207/2011)
- Aircraft identification for surveillance for SES (1206/2011)

VHF 8.33 kHz channel (EC) 1265/2007

- Mandatory above FL245 since 1999.
- Mandatory for GAT above FL195 in ICAO EUR Region since 15 March 2007.
- (EC)1265/2007 air-ground voice channel spacing
  - Operators shall have 8.33 kHz from 15.3.2008 [above FL 195] (Article 3)
  - EASA certification is considered acceptable conformity assessment
  - EUROCAE ED-23B (ETSO-2C37e/2C38e, 2C169a)
  - ICAO Annex 10, Volume III, Part 2
    (First Edition — July 1995 incorporating Amendment No 85)

VHF 8.33 kHz channel (EC) 1079/2012

- Below FL195
  - Initial phase (17.11.2013)
    - All new aircraft that are installed with radios must have 8.33 kHz channel spacing capability
  - Interim phase (01.01.2014)
    - Aircraft operating under IFR as GAT, in airspace classes A, B or C of the participating Member States must be equipped with 8.33 kHz capable radios
  - Final phase (31.12.2018)
    - All aircraft, equipped with radios, to be capable of 8.33 kHz channel spacing capability

VHF radio in SESAR

- VHF voice communications will be the main means of communication for air/ground and air-air voice communications until the year 2030

Data Link Services

- Applicable from 7. February 2013
  - Above FL 285
  - For aircraft with initial
    - CofA after 1.1.2011 fully
    - CofA before 1.1.2011 retrofit until 5.2.2015

  unless
  - CofA before 1.1.2014 and equipment ED-100 or ED-100A (*Interoperability requirements for ATS applications using ARINC 622 Data Communications*) compliant
  - CofA before 1.1.1998 which are not entering the airspace any more after 31.12.2017
  - State aircraft
  - Testing, delivery, maintenance, temporarily inoperative (MEL)
- Deviation Decision (20.5.2011) is published listing exempted aircraft types

Surveillance for the SES

- Commission Implementing Regulation (EU) No 1207/2011 performance and interoperability of surveillance (SPI)
- Aircraft first CofA on or after 8.1.2015: Mode S Elementary Surveillance, MTBF >= 5000 hours
  - Aircraft exceeding 5700 kg or Cruising true airspeed capability > 250 knots: Enhanced Surveillance
  - Fixed Wing Aircraft exceeding 5700 kg or Cruising true airspeed capability > 250 knots: ADS-B
  - Retrofit until 7.12.2017

SPI Conformity Declaration

- Article 10 requires an EC declaration of conformity or suitability for use provided in Article 5 of Regulation (EC) No 552/2004
- EASA certification is considered an adequate procedure for conformity assessment.
- Article 14 exemptions on aircraft types

SPI Transponder requirements

- 1. The minimum capability for the secondary surveillance transponder shall be Mode S Level 2 certified in accordance with paragraphs 2.1.5.1.2, 2.1.5.1.7 and 3.1.2.10 of Annex 10 to the Chicago Convention, Volume IV, Fourth Edition including all amendments up to No 85.
  - Equivalent to ED-73E
- 6. The continuity of transponder functionality supporting the Mode S protocol shall be equal to or less than $2*10^{-4}$ per flight hour (i.e. mean time between failure equal to or greater than 5000 flight hours).

SPI ADS-B requirements

- Transmitter compliant to DO-260B
- Certified GNSS sensor providing Integrity and accuracy information
- System Integrity less than 10^{-5} /h
- Uncompensated latency less than 0.6 second
- AMC 20-24 is not sufficient. New material will be developed similar to FAA AC 20-165

EASA Safety Regulation: TCAS

- (EU) 1332/2011:
  - 1.3.2012 TCAS version 7.1 mandated
  - The following turbine-powered aeroplanes shall be equipped with collision avoidance logic version 7.1 of ACAS II:
    - (a) aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; or
    - (b) aeroplanes authorised to carry more than 19 passengers.
  - Retrofit until 1.12.2015 including those having voluntary carriage

Thank you for your attention
Any questions?